



# Advancing digital transformation with Blockchain



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The **Digital Single Market** powered by new EU-wide regulations will enable convenient **cross-border** online digital services.



Submitting tax declarations online



Enrolling in a foreign university



Remotely opening a bank account



Setting up a business in another Member State



Authenticating an online payment



Bidding to an online call for tender cross borders

... and many, many more.

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# AGENDA

- 1. Blockchain 101**
- 2. Blockchain at the European Commission - the big picture**
- 3. Blockchain as a multi-purpose building block**

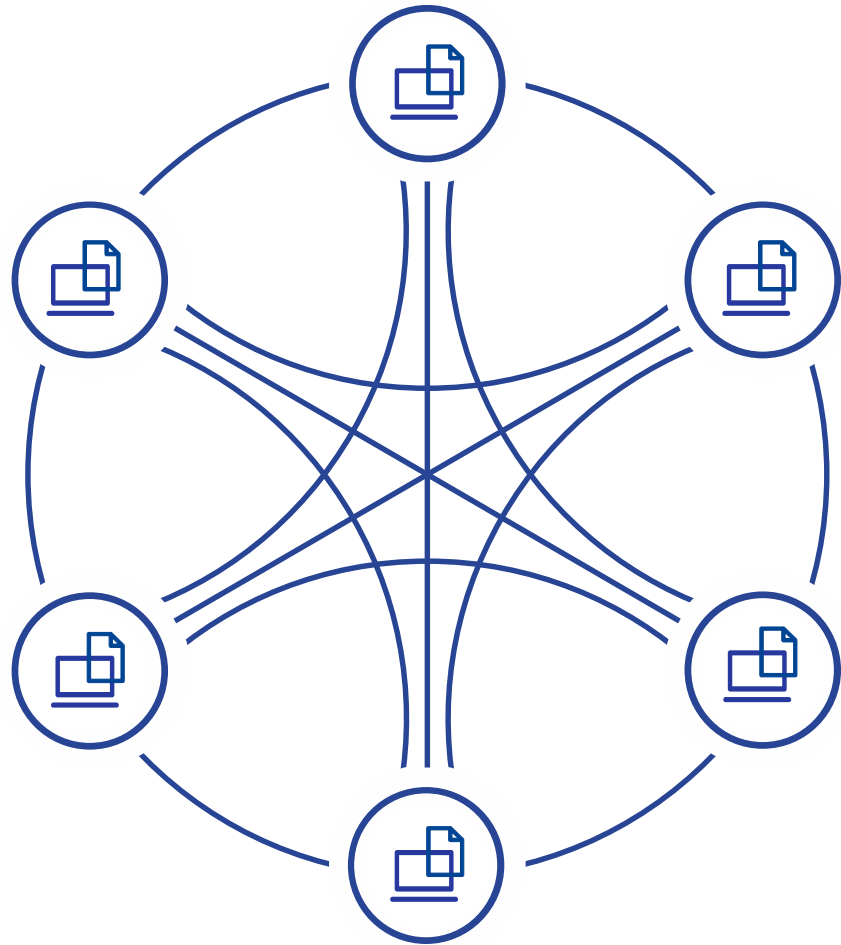


# Blockchain 101

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# What is blockchain?



A LEDGER is a well-known concept used in business as a log keeping a definitive record of transactions.

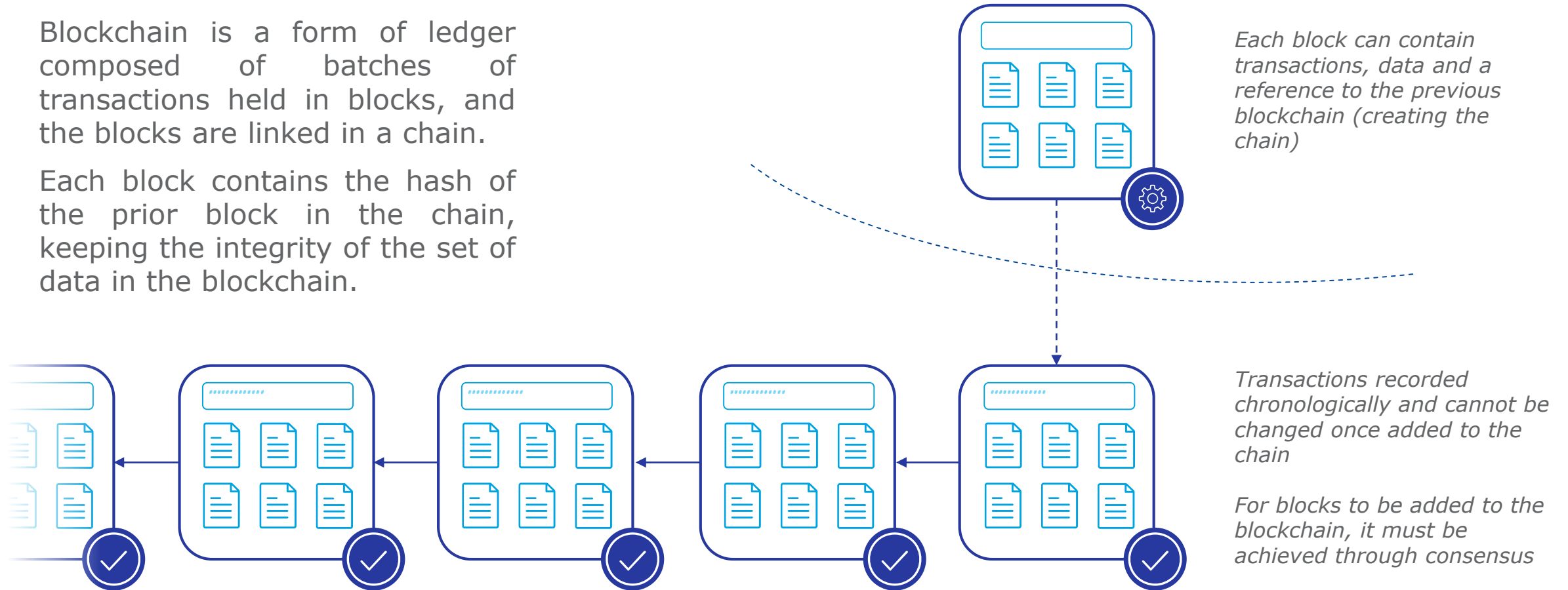
LEDGERS are used to record transactions of almost any type. For example, the status of a document.

**A DISTRIBUTED LEDGER is a ledger that has its entries stored across a series of nodes in a network, rather than in a single location making it "tamper-resistant".**

# Blockchain use of cryptography

Blockchain is a form of ledger composed of batches of transactions held in blocks, and the blocks are linked in a chain.

Each block contains the hash of the prior block in the chain, keeping the integrity of the set of data in the blockchain.



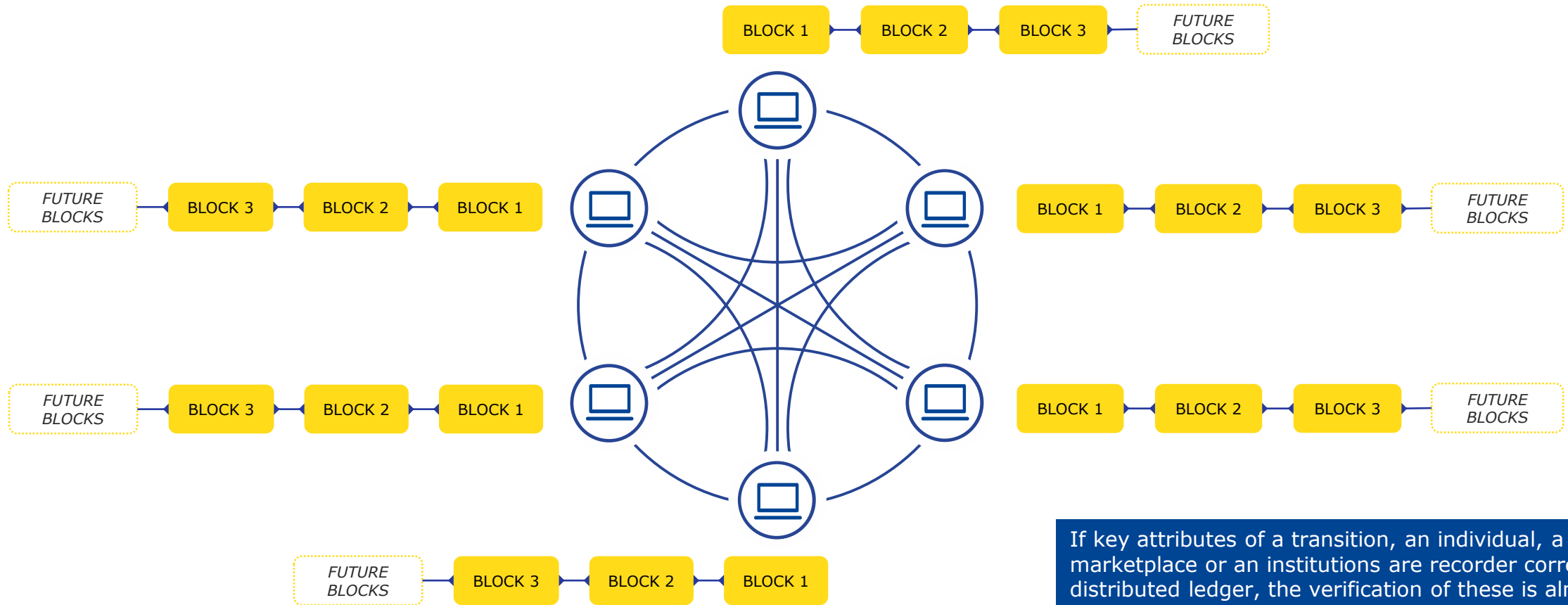
*Each block can contain transactions, data and a reference to the previous blockchain (creating the chain)*

*Transactions recorded chronologically and cannot be changed once added to the chain*

*For blocks to be added to the blockchain, it must be achieved through consensus*

# Blockchain is distributed

Every node maintains an identical copy of the Blockchain – there is no one master node



If key attributes of a transaction, an individual, a marketplace or an institution are recorded correctly in a distributed ledger, the verification of these is almost costless.

This makes it possible to build data integrity into a service and into a system, from the ground up.

Source: MIT SLOAN School of Management

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# How do transitions/ blocks get validated when there is no central authority?

The finality of each new block is agreed via a **shared consensus** mechanism depending on which consensus mechanism is used on the platform



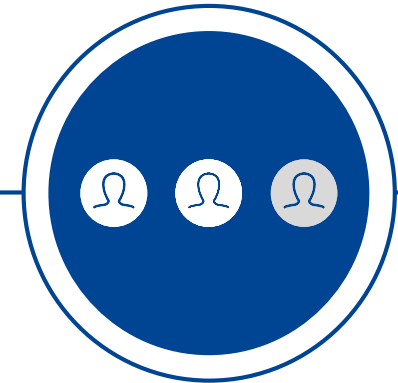
Proof of  
Work



Proof of  
Stake



Proof of  
Authority



Practical Byzantine  
Fault Tolerance



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# Identified areas of interest in the European Commission



Smart contracts for Grants & Procurement



Track and trace against fraud



Authenticity of official EU documents and publications



Diplomas for transparent education



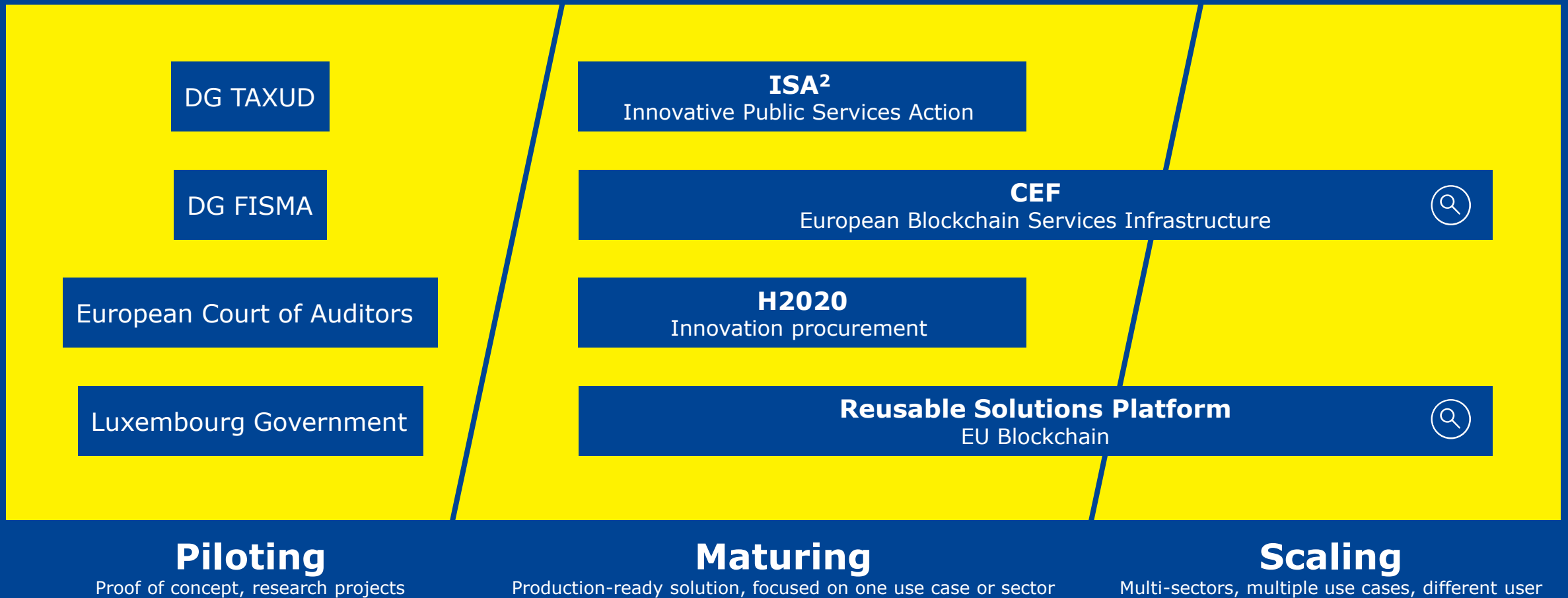
# Blockchain at the European Commission - the big picture

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# Blockchain at the European Commission

## The Big Picture \*

Today we will hear  
more about this



\* Are you busy with something not shown here? Write it down on the "idea card"

Today we will hear more about this



2019

2020

2021

Q4

Q1

Q2

Q3

Q4

Q1

### EU Programmes

**CEF** / European Blockchain Services Infrastructure

Assessment of 2020 use cases



Go-live EBSI v1

Go-live EBSI v2



**ISA<sup>2</sup>** / Innovative Public Services Action



Self Sovereign Identity pilot



eDelivery pilot \*

**H2020** / Innovation procurement



Pre-Commercial Procurement (PCP)



### European Commission Digital Strategy

**Reusable Solutions Platform** / EU Blockchain



Concept formalisation

Service set-up \*



### EUI pilots

DG TAXUD



Pilot

DG FISMA



Pilot

European Court of Auditors

Pilot



### Other Initiatives...

\* To be confirmed / defined

# An ambitious EU-wide Blockchain strategy

## ESTABLISHING GLOBAL LEADERSHIP IN BLOCKCHAIN AND DISTRIBUTED LEDGER TECHNOLOGIES



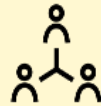
### Joined-up political vision (EU-MS)

Joint declaration on the establishment of the European Blockchain Partnership [EBP] and the development of the European Blockchain Services Infrastructure [EBSI] for cross-border digital services of public interest



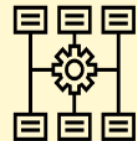
### Public-private partnership

Supporting the creation of the International Association of Trusted Blockchain Applications [INATBA]; a multistakeholder organisation to promote trust and interoperability at Global level



### Connecting Global Expertise

The EU blockchain observatory and forum brings together the leading global experts to identify obstacles, incentives and practical solutions to promote blockchain uptake.



### Investing in EU Innovation and start-ups

Through The Connecting Europe Facility and H2020 Programmes, the EU is co-investing in the most advanced digital infrastructure and the most innovative EU start-ups  
**New** EU investment scheme for AI and blockchain + support programme

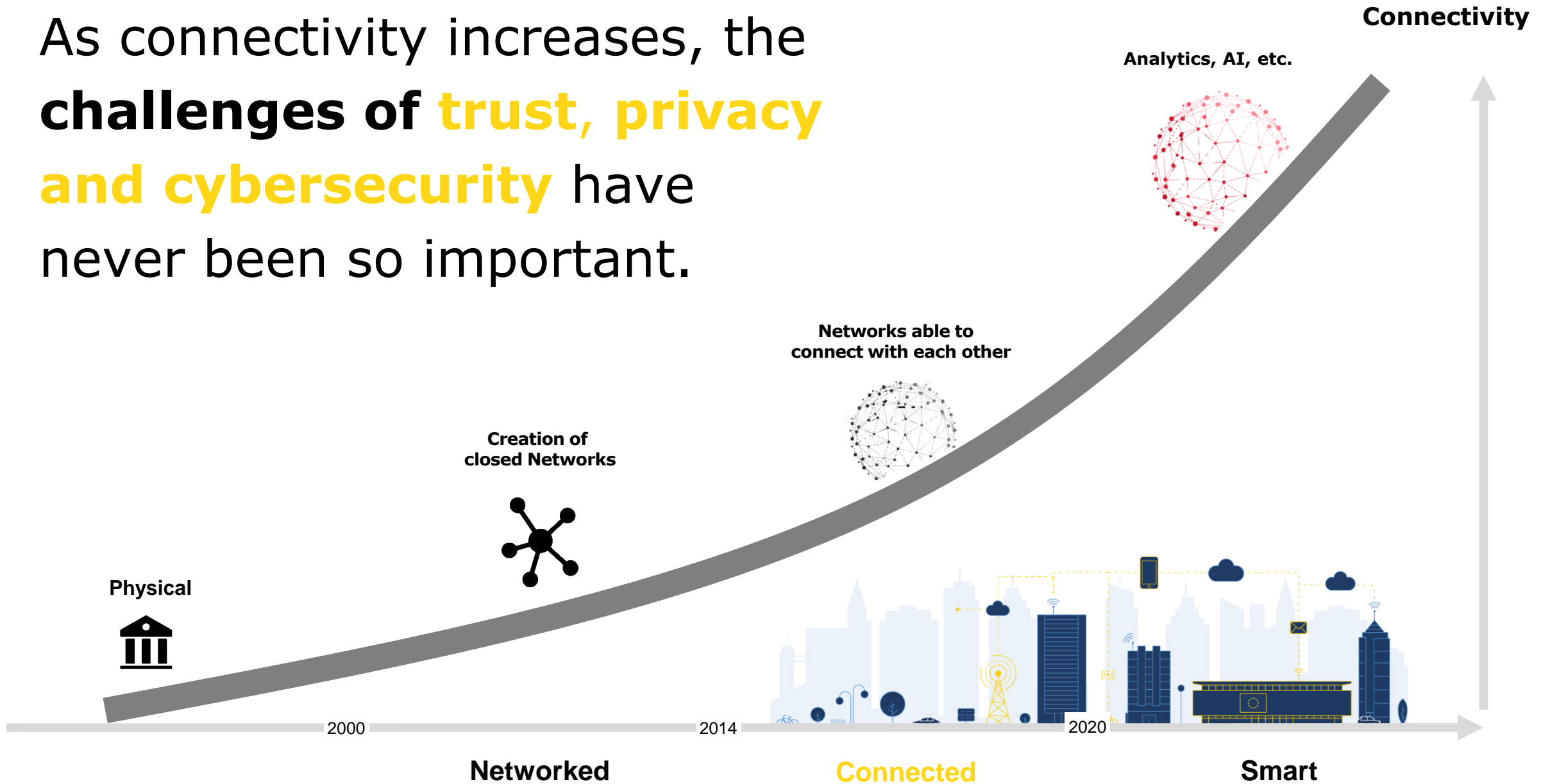


### Promoting an enabling DSM legal framework interoperable standards and skills development

Blockchain as a  
multi-purpose  
building block

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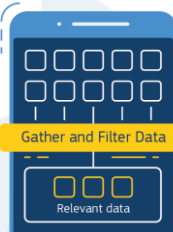
As connectivity increases, the **challenges of trust, privacy and cybersecurity** have never been so important.



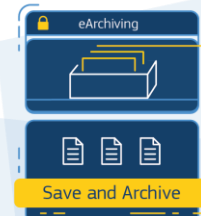
# Digital Europe's building blocks are designed to help you build **digital services people can trust**



**Big Data Test Infrastructure**



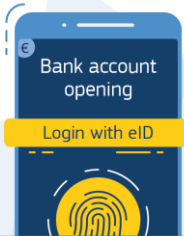
**Context Broker**



**eArchiving**



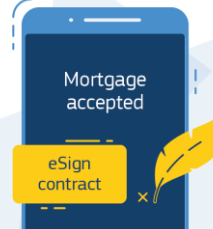
**eInvoicing**



**eID**



**eDelivery**



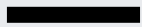
**eSignature**



**eTranslation**



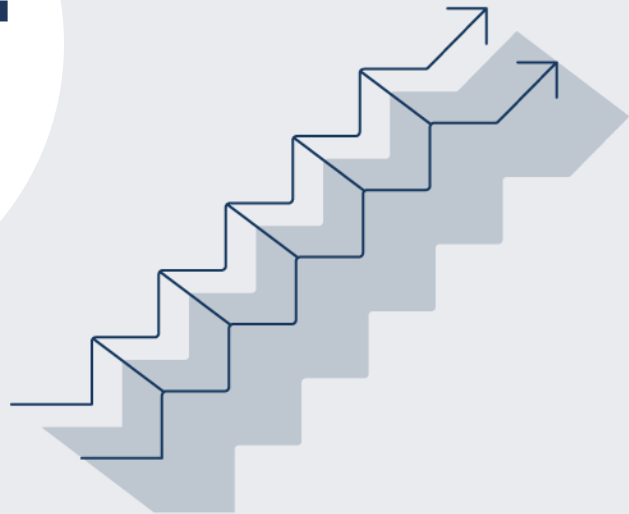
# How many projects have used the building blocks?



**120+**  
projects

[View Dashboard](#)

Growing potential cases are bringing us closer to fulfilling the dream.



# Connecting Europe together

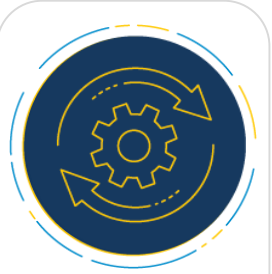
**Co-develop and partner**  
With other parties



**Build**  
The solution from scratch based on a European standard



**Buy**  
A compliant solution from the market

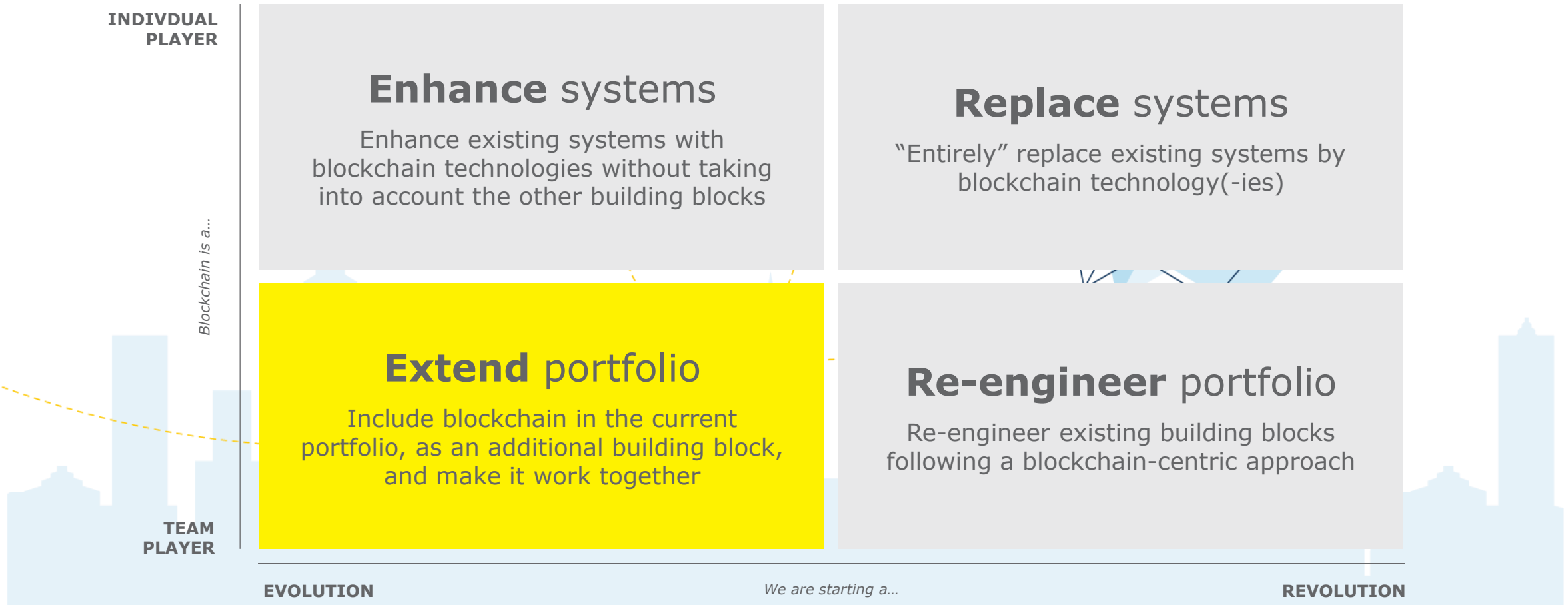


**Reuse**  
A sample software available on CEF website

**European Standards**

# Strategic approach to Blockchain

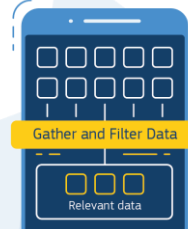
Will **BLOCKCHAIN** be an evolution or a revolution?



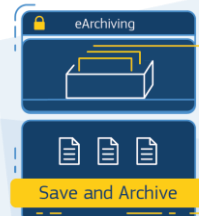
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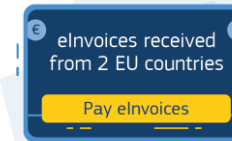
**Big Data Test Infrastructure**



**Context Broker**



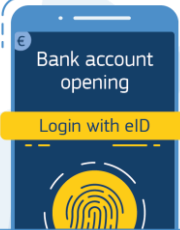
**eArchiving**



**eInvoicing**



**European Blockchain Services Infrastructure**



**eID**



**eDelivery**



**eSignature**



**eTranslation**

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# EUROPEAN BLOCKCHAIN PARTNERSHIP

## What is the European Blockchain Services Infrastructure (EBSI) 2019-2020?

### **EBSI means services and infrastructure**

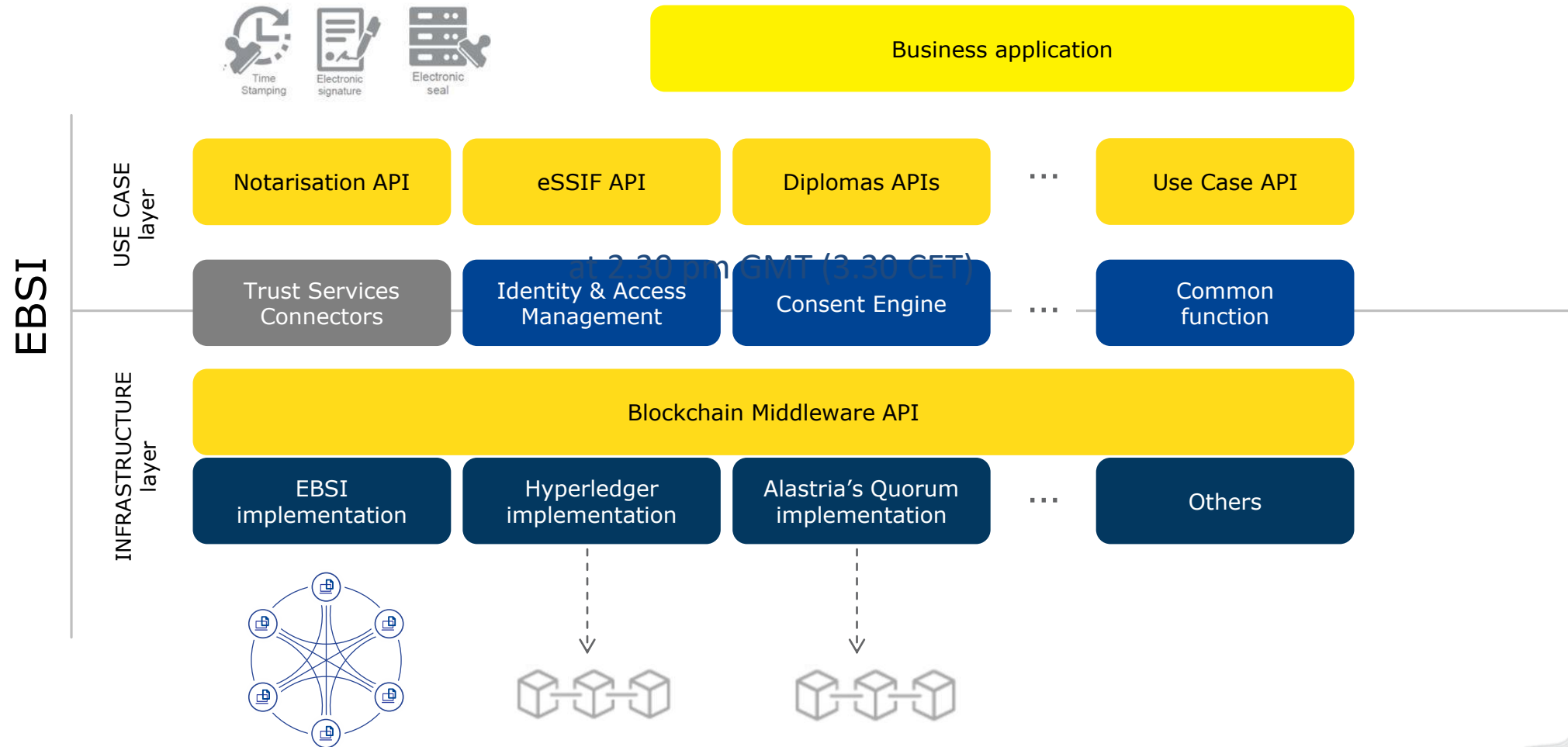
- The use cases (services) with specific focus on the delivery of cross-border digital public services.
- The infrastructure aspects including the blockchain nodes at EBP / Member State level and the central services provided by the European Commission.
- The same infrastructure is expected to be re-used in different use cases.

### **EBSI will be built and upgraded through different versions and iterations**

- Starting with use cases that may build on existing blockchains or specific solutions
- Proposing a testing and integration environment
- Converging towards common architecture and solution(s) supporting new use cases
- Preparing for an "advanced" architecture and solution(s) supporting more demanding use cases and for interoperability

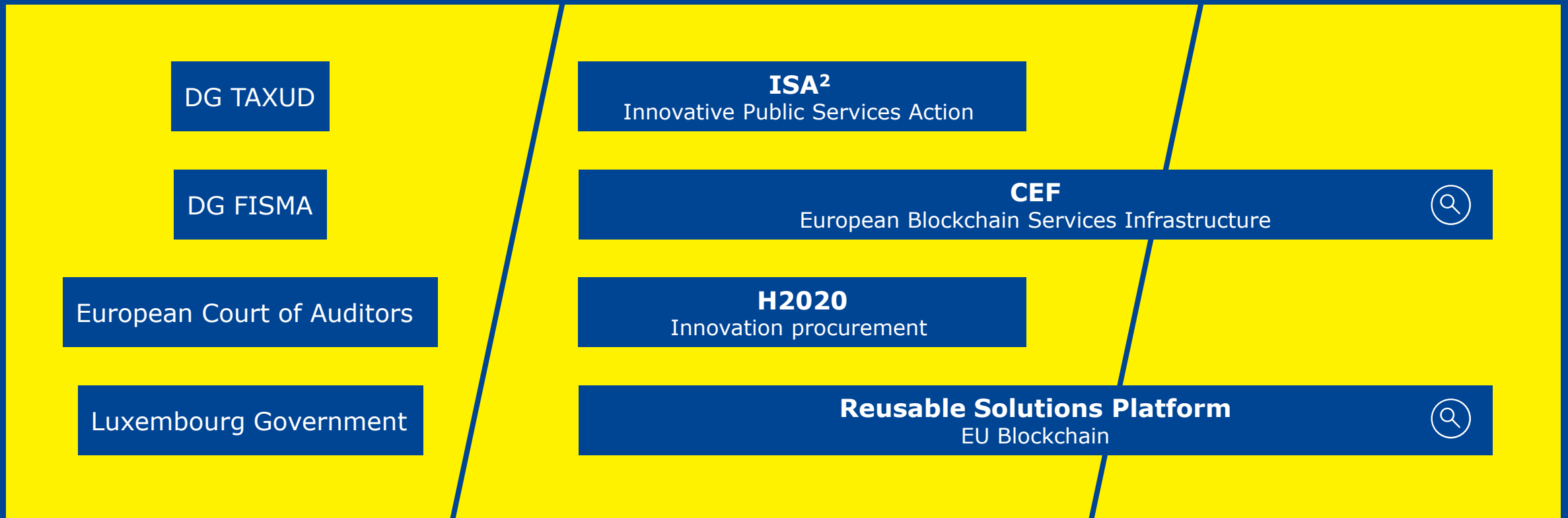
# EUROPEAN BLOCKCHAIN PARTNERSHIP

What is the European Blockchain Services Infrastructure (EBSI) 2019-2020?



# Future plans

Today we will hear  
more about this



## Piloting

Proof of concept, research projects

## Maturing

Production-ready solution, focused on one use case or sector

## Scaling

Multi-sectors, multiple use cases, different user

\* Are you busy with something not shown here? Write it down on the "idea card"

# Ready to get started?

Reach out to us to learn more!

Or visit our website [www.ec.europa.eu/cefdigital](https://www.ec.europa.eu/cefdigital)

